

hat is claimed is:

1. A circuit arrangement for operating an exhaust-gas probe including a NOx double chamber sensor, said exhaust-gas probe including: a heatable solid-state electrolyte body having first and second pump chambers; diffusion barriers for separating said chambers from each other and from the exhaust gas; a third chamber communicating with the atmosphere; an external pump electrode exposed to the exhaust gas; a first oxygen pump electrode disposed in said first pump chamber; a second oxygen pump electrode disposed in at least one of said first and second pump chambers; a nitrogen oxide pump electrode disposed in said second pump chamber; an air reference electrode disposed in said third chamber; and, said circuit arrangement comprising:

circuit means for applying pregivable voltages to said electrodes, respectively, and for generating, in a controlled manner, the following: a first oxygen pump current between said first oxygen pump electrode and said external pump electrode; a second oxygen pump current between said second oxygen pump electrode and said external pump electrode; and, a nitrogen oxide pump current between said nitrogen oxide pump electrode and said external pump electrode; and,

said circuit means including: only one pump voltage generating circuit unit; switching means for switching said pump voltage generating circuit unit between respective ones of said pump electrodes; and, said pump voltage generating unit functioning to generate, in a controlled manner, all of the voltages applied to said pump electrodes in dependence upon respective reference voltages.

2. The circuit arrangement of claim 1, said pump voltage
generating circuit unit including an operational amplifier; said
switching means being switchable to connect respective ones of
said reference voltages and respective ones of said voltages
5 applied to said pump electrodes to said operational amplifier
which compares a corresponding one of said reference voltages to
a corresponding one of said voltages applied to said pump
electrodes; and, said pump voltage generating circuit unit
further including means for minimizing deviations of each of said
10 voltages applied to said pump electrodes from the corresponding
one of said reference voltages.

3. The circuit arrangement of claim 2, said minimizing means
including a plurality of integrators connected to corresponding
ones of three of said pump electrodes; said switching means
including ancillary switching means for connecting the output of
5 said operational amplifier sequentially to said integrators which
integrate corresponding ones of the fault signals outputted by
said operational amplifier; a plurality of current measuring
circuits connected downstream of corresponding ones of said
integrators with said current measuring circuits measuring the
10 pump currents flowing in respective ones of said pump electrodes
and outputting voltage values proportional thereto.

4. The circuit arrangement of claim 1, said switching means being
configured in CMOS technology.

5. The circuit arrangement of claim 1, further comprising a clock
generator for periodically switching said switching means at a
frequency in the kilohertz range.